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Applicant(s): LG Electronics Inc.

COMMISSIONER

**[ABSTRACT OF THE DISCLOSURE]****[ABSTRACT]**

A method of controlling a combined washing and drying machine is provided, which decreases the time required for completing the overall process from washing to drying, prevents reduction of the life cycle of the product and reduces power consumption. The method comprises steps of inputting an operational command after loading laundry into the drum; performing washing and rinsing steps according to the operational command; simultaneously performing a dewatering step and a first drying step after completion of the washing and rinsing steps; and performing a second drying step after completion of the dewatering step. It can decrease the time of the overall process so that it can extend the life cycle of the product and decrease power consumption.

**[TYPICAL DRAWING]**

FIG. 3

**[INDEX WORDS]**

Drying/ fan/ heater

**[SPECIFICATION]****[TITLE OF THE INVENTION]**

METHOD OF CONTROLLING COMBINATION WASHER DRIER

**[BRIEF DESCRIPTION OF THE DRAWINGS]**

FIG. 1 is a cross-sectional view of a general combination washer drier;

FIG. 2 is a flowchart of a combination washer drier controlling method according to a related art; and

FIG. 3 is a flowchart of a combination washer drier controlling method according to the present invention.

**[DETAILED DESCRIPTION OF THE INVENTION]****[OBJECT OF THE INVENTION]****[FIELD OF THE INVENTION AND DISCUSSION OF THE RELATED ART]**

The present invention relates to a combination washer drier, and more particularly, to a method of controlling a combined washing and drying machine.

Generally speaking, washing machines can be classified into a top-loading pulsator type which rotates fan and washing chamber and a front-loading drum type which rotates the drum.

Nowadays the name recognition of a front loading drum type which can consume little water and reduce

damage of the laundry is getting higher, the use of that washer is also increasing significantly, and a combination of washer drier has been launched to increase convenience of the user.

A general combination washer drier, like FIG. 1 illustrates, is comprised of a body 1; a tube 2; a drum 3, rotated by a drum motor(not shown) to perform washing and drying; a pump 4 for draining water; a fan 5 for circulating air to dry the laundry in the drum 3; a heater 6 for heating the air circulated by the fan 5; a supply valve 7, installed in an air circulation passage, to supply water for producing condensed water from humid air passing through the drum 3; and a pair of temperature sensors 8 and 9, installed at the air circulation passage and the tub 2, respectively, for monitoring a drying state.

A combination washer drier controlling method according to a related art as above described is as follows referring to FIG. 2.

First, a user loads the laundry in the drum 3 and presses a predetermined operational key to start doing laundry.

Next, the microcomputer detects a laundry amount, performs a water supply operation according to the detected laundry amount, which is followed by a draining

of the water, and drives the drum motor to perform a washing step (S21).

A rinsing step (S22) is then performed through a similar operation of supplying water and driving the drum motor to drain the water.

Thereafter, a dewatering step (S23) is performed by driving the pump 4 and drum motor. In doing so, the drum is rotated at a predetermined rotational speed for a time set manually by the user or a time set automatically according to the laundry amount.

And, drying begins upon completion of the dewatering step of the wash cycle. In doing so, the fan 5, heater 6, supply valve 7, pump 4 and drum motor are actuated (S24).

In performing the above drying step, the drum motor starts to rotate the drum 3 as soon as the fan 5 and heater 6 begin to operate, so that high-temperature air passes over the laundry in the drum and is recirculated by the fan, absorbing the water contents of the laundry. A completed drying state is determined by the microcomputer, which reads measurement values of the temperature sensors 8 and 9, then, calculates the numerical difference between two values, and progresses drying until when the numerical difference is in the predetermined range. While the drying proceeds, the

microcomputer drives (opens) the supply valve 7 to supply the air circulation passage with water. The water supplied from the supply valve 7 cools humid air, i.e., air containing water, to produce condensed water, which is discharged via a condensation pipe. Hence, only air which has had its water content removed, i.e., dry air, circulates through the fan 5 and the heater 6 to be heated.

Thereafter, the microcomputer recognizes whether the drying is completed, i.e., as above described, after calculating the numerical difference between two measurement values of the temperature sensors 8 and 9, if the numerical difference is in the predetermined range, it judges the drying completed, stops the fan 5, the heater 6, the drum motor, the supply valve 7, pump 4 and so on, and finishes the drying process.

The above-described combination washer drier according to the related art increases convenience because it can do washing, dewatering and drying at the same time, but it requires a long time to complete the drying step. Therefore not only improving washing and drying function but also shortening the overall process time can be an important factor to increase competitiveness of the product.

**[TECHNICAL TASKS TO BE ACHIEVED BY THE INVENTION]**

In the progress of combination washer drier according to the related art, after completing dewatering, it performs drying. Therefore, it requires a long time to dry so that the overall process time become longer, which stresses the various load, reduces the life cycle of the product and consumes excessive power.

Accordingly, the present invention has been devised to solve the foregoing problem, i.e., to provide a method of controlling a combined washing and drying machine that decreases the time for completing the overall process from washing to drying, prevents the life cycle of the product from being shortened and reduces power consumption.

**[SYSTEM AND OPERATION OF THE INVENTION]**

The present invention comprises steps of inputting an operational command after loading the laundry into the drum; performing washing and rinsing steps according to the operational command; simultaneously performing a dewatering step and a first drying step after completion of the washing and rinsing steps; and performing a second drying step after completion of the dewatering step.

Hereafter, a preferred embodiment of the present

invention will be described in detail with reference to the accompanying drawings.

FIG. 3 is an embodiment of the present invention and a flowchart of a combination washer drier controlling method according to the present invention.

Like FIG 3 illustrates, a method of controlling a combined washing and drying machine is as follows. First, a user loads the laundry in the drum 3 and presses a predetermined operational key to start washing.

Next, the microcomputer (not shown) detects a laundry amount, performs a water supply operation according to the detected laundry amount, which is followed by a draining of the water, and drives the drum motor to perform a washing step (S31).

A rinsing step (S32) is then performed through a similar operation of supplying water and driving the drum motor to drain the water.

Thereafter, a dewatering and a pre-drying step (S33) are performed by driving the drum motor, the pump 4, the fan 5, and the heater 6. In doing so, the drum is rotated at a predetermined rotational speed for a time set manually by the user or a time set automatically according to the laundry amount.

More specifically, in processing dewatering, pre-drying step is performed as soon as dewatering step is

performed by driving the fan 5 and the heater 6 except for supply valve 7. Here, supply valve 7 is not driven because the production of condensed water from the circulating air is ineffectual due to the excessive water content of the laundry during dewatering.

And, drying begins upon completion of the dewatering step of the wash cycle. In doing so, the fan 5, heater 6, supply valve 7, pump 4 and drum motor are actuated (S34).

Here, in performing the above drying step, the drum motor starts to rotate the drum 3 as soon as the fan 5 and heater 6 begin to operate, so that high-temperature air passes over the laundry in the drum and is re-circulated by the fan 5, absorbing the water contents of the laundry. A completed drying state is determined by the microcomputer, which reads measurement values of the temperature sensors 8 and 9, then, calculates the numerical difference between two values, and progresses drying until when the numerical difference is in the predetermined range. While the drying proceeds, the microcomputer drives (opens) the supply valve 7 to supply the air circulation passage with water. The water supplied from the supply valve 7 cools humid air, i.e., air containing water, to produce condensed water, which is discharged via a condensation

pipe. Hence, only air which has had its water content removed, i.e., dry air, circulates through the fan 5 and the heater 6 to be heated.

Here, pre-drying step is performed as soon as dewatering step is performed, so drying is completed more quickly than existing step.

Thereafter, the microcomputer recognizes whether the drying is completed, i.e., as above described, after calculating the numerical difference between two measurement values of the temperature sensors 8 and 9, if the numerical difference is in the predetermined range, it judges the drying completed, stops the fan 5, the heater 6, the drum motor, the supply valve 7, pump 4 and so on, and finishes the drying process.

#### [EFFECT OF THE INVENTION]

A method of controlling a combined washing and drying machine according to the present invention decreases the overall process time so that it extends the life cycle of the product and reduces power consumption. So, it has an effect on improving the competitiveness of the product in the end.

A method of controlling a combination washer drier adopting the air circulating method described above is the embodiment of the present invention. The

main point of the present invention is that performing pre-drying step while dewatering so that it can reduce substantial overall process time. A combination washer drier adopting the method of the present invention is not limited to an air circulation type or condensation type washer drier, but is applicable to any washing machine performing a drying procedure after dewatering.

**What is claimed is:**

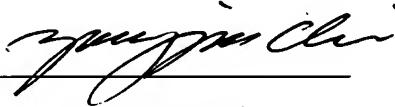
1. A method of controlling a combination washer drier, comprising of:
  - inputting an operational command after loading laundry into the drum;
  - performing washing and rinsing steps according to the operational command;
  - simultaneously performing a dewatering step and a first drying step after completion of the washing and rinsing steps; and
  - performing a second drying step after completion of the dewatering step.

## **CERTIFICATE OF VERIFICATION**

I, Yongjun Choi of Family Apartment 207-1201, Moonjung-dong, Songpa-gu, Seoul, Republic of Korea state that the attached document is true and complete translation to the best of my knowledge of the Korean-English language, and that the writings contained in the following pages are correct English translation of the specification and claims of Korean Patent Application No. P2002-74049.

Dated this 19<sup>th</sup> day of February, 2008

Signature of translator:



Yongjun Choi